PISAR'KOV, Khariton Alekseyevich; TIMOFEYEV, Aleksandr Filippovich; BUDYKA, S.Kh., prof., retsenzent; YELPAT'YEVSKIY, M.P., red.

[Hydraulic engeneering in the improvement of forest soils] Gidrotekhnicheskie melioratsii lesnykh zemel'. Izd.2., isp. i dop. Moskva, Izd-vo "Lesnaia promyshlennost'," 274 p. (MIRA 17:4)

1. Belorusskiy tekhnologicheskiy institut im. S.M.Kirova (for Budyka).

AKSENOV, V.P., kand.tekhn.nauk; TSIVILEV, V.A., inzh.; BUDYKA, V.I., inzh.

Analysis of the present state of and outlook for quarrying building materials in the Ukraine. Nauch.zap.Ukrniiproekta no.5:89-95 '61. (MIRA 15:7)
(Ukraine--Quarries and quarrying)

BUDYKA, Ya. N., (Doz)

Doz. Y. N. Budyka, "A Tooth System for Minimum Wear for Straight-Tooth Cylindrical Gear Drives."

paper presented at the 2nd All-Union Conf. on Fundamental Problems in the Theory of Machines and Mechanisms, Moscow, USSR, 24-28 March 1958.

BUDYKA, Yu. N.

Mathematical Reviews
Vol. 14 No. 7
July-Aug. 1953
Number Theory

Budyka, Yu. N. Meshing theory and the relative wear resistance of plane engagements of general type. Akad. Nauk SSSR. Trudy Sem. Teorii Masin i Mehanizmov 10, no. 39, 56-74 (1951),(Russian)
The problem is to design open (nonlubricated) plane gearings with less than the conventional wear of cycloidal teeth. The author first determines the normal reaction between any two conjugate profiles (it is proportional to $\sin 2\alpha_0 - 1/2$ where α_0 is the meshing angle. Since $\alpha_0 = 45^\circ$ (for reason of undercutting), the author proposes to minimize wear by minimizing the specific work of friction, and finds that is not a minimum for cycloidal gearing. Some design aspects are discussed, and a continuation of the paper announced.

A. W. Wundheiler (Chicago, Ill.).

BUDYKHO, P.K.

BUDYKHO, P.K.; ZOLOTOVA, Z.G. (g. Ul'yanovsk)

Demonstrating the density of carbon dioxide. Khim. v shkole 13 no.1:53-54 Ja-F '58. (MIRA 10:12)
(Carbon dioxide)

BARSKAYA, T.A.; BUDYKINA, N.P.

Effect of soil temperature on the intensity of root respiration and the flow of carbohydrates. Trudy Kar. fil. AN SSSR no.37: 78-86 '64. (MIRA 18:3)

GASUL', R.Ya., prof.; BUDYKO, A.L.

Activity of the Zaporozh'ye Province Society of Roentgenologists and Radiologists for 1957-1958. Vest.rent. i rad. 34 no.4:93-94 Jl-Ag '59. (MIRA 12:12)

1. Predsedatel' Zaporozhskogo oblastnogo nauchnogo obshchestva rentgenologov i radiologov.
(ZAPOROZH'YE PROVINCE--RADIOLOGY, MEDICAL)

GASUL', R.Ya., prof.; BUDYKO, A.L.

Activity of the Zaporozh'ye Province Scientific Society of Roentgenologists and Radiologists for 1962. Vest. rent. i rad. 38 no.5:71-72 S-O '63 (MIRA 16:12)

1. Predsedatel' pravleniya Zaporozhskogo oblastnogo nauchnogo obshchestva rentgenologov i radiologov (for Gasul'). Sekretar' Zaporozhskogo oblastnogo nauchnogo obshchestva rentgenologov i radiologov.

SHCHERBAKOV, D.I., akademik; BABAT, G.I., prof. doktor tekhn. nauk; ZHELTENKOV, V., inzh.; VERD'YE, Zhan, zhurnalist (Frantsiya); RUBASHEV, B.; GRIGOR'YEV, S., inzh.; SAUKOV, A.A.; VASIL'YEV, M., inzh.; POMAZOVICH, N., prof.; GALINA, L.M., muzykoved-fol'klorist; KERSHNER, D., biolog; BUDYKO, I., prof.; SEMENOV, S., zhurnalist.

Discoveries to be made. Znan. sila 32 no.11:27-32 N '57. (MLRA 10:11)

1. Ispolnyayushchiy obyazannosti uchenogo sekretarya Glavnoy astronomicheskoy observatorii (for Rubashev). 2. Chlen-korrespondent AN SSSR (for Saukov). 3. Direktor Glavnoy geofizicheskoy observatorii im. A.I. Voyeykova (for Budyko).
(Science)

BUDYKO, M. I.

"The Turbulent Exchange in the Lower Layers of the Atmosphere, Meteorology and Hydrology, 1946, Nr. 2.

BUDYKO, M. I.

"Methods of Determining Natural Evaporation," Meteorologiya i gidrelegiya, No 3, 1946.

Also: U-2224, 6 Aug. 52.

BUDYKO, M. I. & E. S. LIATIN

RT-1523 (Conditions for the formation of thermal convection in the lower layers of the atmosphere) Usloviia obrazovaniia termicheskoi konvekcii v nizhnikh sloiakh atmosfery.
SO: Meteorologiia i Gidrologiia, (5): 50-53, 1946

American Meteorological Society

Water Vapor and Heat Exchange

551.573:551.588.6

3.11-171
Budyko, M.I., K teorii isparenila s pochv y, pokrytoi rastitel'nost'iu. (Contribytion to the theory of evaporation from soil with vegetation.) U.S.S.R. Glavnoe Upravlenie Gidro-meteorologicheskoi Sluzhby. Trudy, Naucho issledovantel'skikh Uchrezhdenii Ser. 1, Meteorologiia, No. 34,p. 18-24, 1946
6 refs. 7 equations. DLC-The author uses the theory of the mean value of evaporation by means of the coefficient of turbulent exchange to establish the probable dependence of evaporation from a soil surface covered with vegetation upon the height of the vegetation. The suggested formula shows that evaporation from soil covered with vegetation 10 cm high is 70% and from the surface of grass 33% of the total evaporation. If the grass cover is 20 cm high the r latioship will be approximately 50% and 50% These theoretical computations were corroborated by experimental observations, as well as by the fact that the low and unevaporating grass cover 15 cm high reduces by 50% the rate of evaporation from the soil.
Subject Headings: 1. Evaporation theory [redacted]

Budyko, M. I.

7.5-196

551.573

Budyko, M. I., **Izmerenie estestvennogo isparenila.** [Measurements of natural evaporation.] U.S.S.R.—*Glavnoe Upravlenie Gidrometeorologicheskoĭ Sluzhby, Trudy Nauchno-issledovatel'skikh Uchrezhdeniĭ, Ser. 1, Meteorologiia*, No. 34:83–92, 1946. fig., 6 refs. DLC—Two principal methods for determining the total evaporation from soil surface are mathematically analyzed. The first is the so-called gravimetric method (periodical weighing of monoliths (cores) of soil with plants.) The second method, presented by THORNTHWAITE and HOLZMAN, defines the total evaporation by measurement of the specific humidity on two levels above soil surface and by determination of the coefficient of turbulent exchange. The author prefers the second method but points out a mistake in the determination of the coefficient of turbulent exchange which exaggerates the value of evaporation from 200–300%. The author presents his own formula for determining the intensity of natural evaporation through the coefficient of turbulent exchange. *Subject Heading:* 1. **Evaporation measurement.** —*N. T. Zikeev.*

BUDYKO, M. I.

PA 21T109

USSR/Physics Sep 1946
Atmosphere - Temperature
Heat - Transference

"Conditions of Thermal Equilibrium in the Atmosphere," M.I/Budyko, M I Yudin, 4 pp

"Comptes Rendus (Doklady)" Vol LIII, No 7

Mathematical discussion of the heat exchange in the atmosphere, and of atmospheric turbulence or eddies. It is concluded that the lapse rate of temperature is 6 c/km. The authors recommend the abandonment of the generally-accepted opinion that a mean eddy heat flow exists in the vertical direction from the atmosphere toward the ground.

21T109

Also: B-2284, 17 Mar. 48

BUDYKE, M.I.

"Water and Heat Balances of the Land Surface," Meteorologiya i gidrologiya (Meteorology and Hydrology), No 5, 1947.

SO: U-3039, 11 Mar 1953

BUDYKO, M. I.

"The Thickness of the Air-Layer Influenced by the Ground, Transactions of the Main Geophysical Observatory, Edition 6 (68) 1947.

BUDYKO, m. i.,

Meteorological Abst.
Vol. 4 No. 2
Feb. 1953
Bibliography on
Turbulent Exchange

4B-144 ✓ 551.573 551.551

Budyko, M. I., Vlianie meteorologicheskikh faktorov na isparenie uvlazhnennoi pochvy. [The influence of meteorological factors on evaporation from moist soil.] *U.S.S.R. Glavnoe Upravlenie Gidrometeorologicheskoi Sluzhby, Trudy Nauchno-issledovatel'skikh Uchrezhdenii, Ser. I. Meteorologiia*, No. 25, Fizika Prizemnogo Sloia Atmosfery, p. 3–13, 1947. 7 figs., eqs. DLC—The investigations carried out by the author show that the well-known law of DALTON has sufficient accuracy for the computation of the evaporation from an open surface. The dependence of the evaporation rate from the intensity of the turbulence exchange, wind velocity, soil temperature, and humidity of the air is determined. The author presents the following formula for the computation of evaporation from the moist soil. $E = A(P_s - P_a)U^{0.75}(Ri_s - Ri)^{0.75}$ where A is coefficient depending on the thickness of rough layer, P_s and P_a-absolute humidity of the air near the ground and near the evaporating surface; Ri_s and Ri are Richardson's numbers determined by potential temperature of the air, absolute humidity, wind velocity and the acceleration of gravity. *Subject Headings:* 1. Evaporation from soil 2. Micro meteorological turbulence.—*A.T.Z.*

BUDYKO, M.I.

PHASE I TREASURE ISLAND BIBLIOGRAPHICAL REPORT AID 422 - I

Call No.: QC915.B8

BOOK

Author: BUDYKO, M. I.

Full Title: EVAPORATION UNDER NATURAL CONDITIONS

Transliterated Title: Isparenlye v yestestvennykh usloviyakh

Publishing Data

Originating Agency: None

Publishing House: Publishing House of Hydrometeorological Literature

Date: 1948 No. pp.: 136 No. of copies: 8,000

Editorial Staff

The author expresses thanks for valuable assistance to the Staff of the Division of Applied Meteorology, Main Geophysical Observatory, and particularly to its Chief, Prof. M. I. Yudin, editor of this book.

Text Data

Coverage: This is a general review of basic investigations on evaporation under natural conditions and an account of the work performed over several years in the Division of Applied Meteorology of the Main Geophysical Observatory. One of the essential tasks was the development of physical methods of determining evaporation from the land surface. The use of these methods makes possible the computation of the run-off in any area through different periods. The establishment of a connection between the hydrological characteris-

tic (the run-off) and meteorological factors (intensity of turbulent mixing in the air layer near the ground, and heat balance) shows the possibility of a rapprochement of meteorological and hydrological research in this field. On the basis of his own investigations, the author points out what he calls the erroneous theories and methods of foreign scientists e.g., in Ch. II, the theory of turbulent heat exchange of G. I. Taylor and W. Schmidt; in Ch. IV, C. S. Rossby and H. U. Sverdrup's theory of turbulent exchange in the air layer near the ground; in Ch. V, Sverdrup's conclusions on boundary conditions of moisture exchange; in Ch. VI the method of determining evaporation of C. W. Thorntwaite, Chief of the Climatic and Physiographic Division, U.S. Dep't. of Agriculture, and B. Holzman. The evaporation measurements made at the U.S. Dep't. of Agriculture Experimental Farm in Arlington, Va., are declared to be incorrect. The author considers his critical approach essential because false deductions of foreign geophysicists are sometimes carried over in the reviews and investigations of Soviet scientists. The book contains tables and 26 diagrams.

TABLE OF CONTENTS

Isparenlye v yestestvennykh usloviyakh

AID 422 - I

PAGES

Ispareniye v yestestvennykh usloviyakh AID 422 - I

Purpose: Study of physical methods of determining evaporation to be applied for solving equations of heat and water balance of the underlying surface.

Facilities: Division of Applied Meteorology, Main Geophysical Observatory.

No. of Russian and Slavic References: Total 235, 105 Russian.

Available: Library of Congress.

BUDYKO, M. I. PA 167T91

USSR/Meteorology - Lapse Rate Jan/Feb 48
Heat Exchange

"Heat Exchange of the Earth's Surface With the Atmosphere and the Equilibrium Temperature Gradient," M. I. Budyko, M. I. Yudin

"Meteorol i Gidrol" No 1, pp 16-30

Proves "Schmidt paradox" is erroneous. Schmidt, in contrast to generally accepted notion, concluded average turbulent heat flow is directed from atmosphere to earth, using equilibrium temperature gradient of 5-6° C/km.

167T91

Also: U-2224, 6 Aug. 52.

BUDYKO, M. I.

PA 162T49

USSR/Geophysics - Climatology Jul/Aug 48
Hydrology

"Laws Governing the Surface Physicogeographical Process," M. I. Budyko

"Meteorol i Gidrol" No 4, pp 17-29

Attempts to find from physical considerations quantitative characteristics of "climatic link" (according to Acad A. A. Grigor'yev, surface physicogeographical process is made up of four "links": climatic, hydrological, soil, biological), which determine (1) zonality in distribution of hydrological regimes, vegetation, and soil types and (2) intensity

162T49

USSR/Geophysics - Climatology (Contd) Jul/Aug 48

of surface physicogeographical process, and therefore afford new classification of climatic zones. Submitted 23 Mar 48.

162T49

BUDYKO, M. I.

"Influence of Vertical Temperature Gradients on the Turbulent Exchange in the Atmospheric Layer Near the Ground," Meteorologiya i Gidrologiya, Issue No. 1, 1949.

U-1442, 28 Aug 51

BUDYKO, M.I.

"The Thermal Balance of the Northern Hemisphere." Trudy OGO, No 18, 1949.

AMS

551.5:92

3.5-26

Budyko, M.I., Vydaiushchiisia russkii meteorolog V.N. Karazin.
(The famous Russian meteorologist V.N. Karazin.) Meteorologiia i Gidrologiia,
No. 4:3-9, Dec. 1950. Refs. DLC- A biographical article and a survey of
V.N. Karazin's activity in meteorology and his writings on meteorological subjects.
The idea of organizing a central meteorological establishment with a net
of stations operating uniformly was advanced by Karazin as early as 1818.
Subject Headings: 1. Biography 2. History of meteorology 3. Karazin, Vasilii
Nazarovich.- A.M. P.

Also U-2020, 2952.

AMS/A4 B 1951

2.8-130 551.581

Budyko, M. I., **Klimaticheskie faktory vneshnego fiziko-geograficheskogo protsessa.** [Climatic factors of the external physico-geographical process.] *Leningrad, Glavnaia Geofizicheskaia Observatoriia, Trudy*, 19(81):25-40, 1950. 13 figs., 17 refs., 6 equations. **DLC**

The latitudinal variations in the basic elements of the heat and water balance for the continents and the oceans, and for the Northern Hemisphere, are presented graphically and discussed. Data used in this study are obtained from the work of L'vovich (1945), [illegible] (1943) and [illegible] (1941). Next the diurnal variations in turbulent exchange of heat and moisture are discussed theoretically (after [illegible], 1947) and the theory applied to the various geographic regions of the U.S.S.R. (tundra, forest, steppe, semi-arid and desert) in order to determine the relation between vegetation regions and the heat/moisture balance. The relation between runoff and precipitation is shown in theory and practice and, finally, the optimum climatic conditions determined by a process of integrating radiation, moisture and physico-geographical process. *Subject Headings:* **Radiation balance, Hydrologic cycle, U.S.S.R.** *M.R.*

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

Budyko, M. I.

2

3.6-130

551.573

[illegible] M. I. O vliianii meliorativnykh meropriiatii na isparisemost'. [On the [illegible] measures upon evaporation.] Akademiia Nauk SSSR Izvestiia, Se[illegible] No. [illegible] 45 1951 [illegible] 5 figs. 28 refs., 7 equations. DWB. The author presents [illegible] methods of determining and [illegible] values of evaporation from [illegible] geographic [illegible] evaporation and its probable change under the [illegible] Numerous curves are presented to show the relationship between [illegible] temperature, turbulence, latitude, etc. and evaporation [illegible] Subject Headings: 1. Evaporation 2. Potential evapotranspiration [illegible]

Main Geophys. Observ. im. Voyeykov –

BUDYKO, M. I.

PA 196T67

USSR/Geophysics - Quantitative Study Mar/Apr 51

Discussions: "Problem of Quantitatively Calculating Variations in Natural Conditions," M. I. Budyko, O. A. Drozdov, M. I. Yudin

"Iz Ak Nauk, Ser Geog" No 2, pp 57-61

Development of Soviet phys geography is valuable for hydrometrical surveys comprising: meteorology, climatology, hydrology of land and sea, based on Stalin's plan to change of nature. Works by members of the Hydrometrical Survey (K. I. Kashin, Kh. P. Pogosyan, M. I. Budyko and O. A. Drozdov)

196T67

USSR/Geophysics - Quantitative Study (Contd) Mar/Apr 51

proved that atm pptns depend little on soil evapn. Other members of this Survey (A. R. Konstantinov, M. I. Lvovich, S. A. Sapozhnikova, M. I. Yudina) plan forest improvements.

196T67

5.2.227

Budyko, M. I. O klimaticheskikh faktorakh stoka. [On climatic factors of runoff.] Trudy Fizicheskoi Geografi, Moscow, 16:41-48, 1951. 6 figs., 6 refs. 551.579:551.588

2 eqs. DLC--The theoretical formula for determining the relationship between mean annual runoff and climatological elements, irrespective of basin characteristics proposed is:

$$f = r\left[1 - \sqrt{\frac{R}{Lr}\,th\frac{Lr}{R}\left(1 - ch\frac{R}{Lr} + Sh\frac{R}{Lr}\right)}\right]$$

f--runoff; r--mean annual precipitation; R--mean radiational balance at surface; L--latent heat of evaporation. Using the mean radiational balance over the land surface in moderate latitudes the author tested this equation with the results of actual observations; a high degree of precision was revealed for basins, with both average and large runoff coefficients. This formula explains the empirical dependence of runoff on precipitation and on the variation of runoff in mountainous regions. Subject Headings: 1. Runoff 2. Climatic influences.--I.L.D.

BUDYKO, M.I.

PHASE I TREASURE ISLAND BIBLIOGRAPHICAL REPORT AID 624 - I

BOOK

Call No.: AF501068

Authors: Doctors of Physico-Mathematical Sciences Prof. YUDIN, M. I., Doctors of Geographical Sciences BUDYKO, M. I. and DROZDOV, O. A., L'VOVICH, M. I., POGOSYAN, KH. P., and SAPOZHNIKOVA, S. A., Profs.

Full Title: CLIMATIC CHANGES IN CONNECTION WITH THE PROJECT FOR THE TRANSFORMATION OF NATURE IN THE ARID REGIONS OF THE USSR

Transliterated Title: Izmeneniye klimata v svyazi s planom preobrazovaniya prirody zasushlivykh rayonov SSSR

PUBLISHING DATA

Originating Agency: None

Publishing House: Hydrometeorological Publishing House

Date: 1952 No. pp.: 206 No. of copies: 3,000

Editorial Staff

Editor: Prof. Dr., Kh. P. Pogosyan

PURPOSE: Presentation in concise systematic form of the results of fundamental studies of climate amelioration by hydrometeorological institutes and the recommendations to be followed by those interested in climate transformation.

TEXT DATA

Coverage: The monograph is divided into seven chapters and a concluding chapter, the chapters being subdivided into several sections.

1/3 2

Izmeneniye klimata v svyazi s planom preobrazovaniya prirody zasushlivykh rayonov SSSR AID 624 - I

Chapter I presents the climate of the regions in need of amelioration, and is written by S. H. Sapozhnikova and M. I. Budyko; Ch. II, moisture interchange in the atmosphere, by Kh. P. Pogosyan; Ch. III, variations in turbulent interchange, by M. I. Yudin, M. I. Budyko and O. A. Drozdov; Ch. IV, variations in the precipitation regime, by O. A. Drozdov; Ch. V, variations in the heat balance and thermal regime, by M. I. Budyko, S. A. Sapozhnikova and M. I. Yudin; Ch. VI, variations in vaporizability, evaporation and moisture regime of the soil, by M. I. Budyko; Ch. VII, methods of increasing the effectiveness of field-protecting afforestation, by M. I. L'vovich. The final chapter concludes the research presented in the monograph with 14 results, such as: the value of field-protecting afforestation and its effect on the wind, on the decrease of turbulence and turbulent interchange of moisture, on snow drifts, on a small increase of precipitation, on the decrease of the amount of the outflow of water from melting snow, on open spaces, on the heat balance and thermal regime, etc. The book contains a substantial alphabetical list of references, 50 maps, diagrams and graphs, and 36 tables.

2/32

USSR .

6.3-213

551.573

[Budyko, M. I., Influenţa masurilor de amelioratie asupra capacităţii de evaporare. [Influence of amelioration measures upon evaporation.] *Analele Romano-Sovietice, Seria Geologie-Geografie*, 7(10):57-79, July/Aug. 1952. 8 figs., 28 refs., 7 eqs. Translation of original Russian article (*see* 3.6-130, June 1952, *MAB*) into Romanian with reproduction of figures and bibliography. DLC—*Subject Headings:* 1. Evaporation 2. Potential evapotranspiration 3. Shelter belt effects 4. Translations 5. Romanian language.—*M.R.*

BUDYKO, M. I.

USSR/Meteorology - Evaporation Sep 52

"Methods for Determining Evaporation," M. I. Budyko, Dr Phys-Math Sci, M. P. Timofeyev, Cand Phys-Math Sci, Leningrad Geophys Obs imeni Voyeykov

"Meteorol i Gidrol" No 9, pp 3-9

Finds that data on soil evapn is important for evaluation of effectiveness of protective forest belts. The methods mainly used for this purpose are weighing, thermal balance, and diffusion. Analyzes each of these methods and discusses advantages and deficiencies.

231T70

BUDYKO, M.I.; DROZDOV, O.A.; L'VOVICH, M.I.; POGOSYAN, Kh.P.; SAPOZHNIKOVA, S.A.; YUDIN, M.I.

Regularities of climatic changes with respect to the realization of the Stalin plan of transformation of nature. Vop.geog. 28:66-73 '52. (MLRA 7:5)

1. Gidrometsluzhba. (Meteorology, Agricultural) (Windbreaks, shelterbelts, etc.)

AVAKYAN, A.B.; BUDYKO, M.I.; YUDIN, M.I.; OCHAKOVSKIY, Yu.Ye.; DAVYDOV, M.M.; ARMAND, D.L.; FEDOROVICH, B.A.; ZUBOV, N.N.; ANTIPOR-KARATAYEV, I.N.; SAPOZHNIKOVA, S.A.; ALISOV, B.P.; FOTEYEV, I.M.

Discussion of reports of the meeting. Vop.geog. 28:74-96 '52. (MLRA 7:5)

1. Gidroenergoproyekt Ministerstva elektrostantsiy (for Avakyan). 2. Glavnaya geofizicheskaya observatoriya im. A.I.Voyeykova (for Budyko and Yudin). 3. Institut okeanologii Akademii nauk SSSR (for Ochakovskiy). 4. Gidroenergoproyekt Ministerstva elektrostantsiy (for Davydov). 5. Institut geografii Akademii nauk SSSR (for Armand, Fedorovich, and Foteyev). 6. Geograficheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta (for Zubov and Alisov). 7. Pochvennyy institut im. V.V. Dokuchayeva Akademii nauk SSSR (for Antipov-Karatayev, I.N.). 8. Glavnaya geofizicheskaya observatoriya im. A.I.Voyeykova (for Sapozhnikova).

Budyko, M. I.

BUDYKO, M.I.; YUDIN, M.I.

Experimental investigation of the meteorological efficiency of field protecting tree shelterbelts. Trudy GGO no.29:105-113 '52.
(Windbreaks, shelterbelts, etc.) (MIRA 11:1)

DUBENKO, M.I., [illegible], D.L., and [illegible], M.P.

"Determination of the Coefficient of Turbulent Exchange in the Layer of Air Near the Ground," Meteorol. i Gidrologiya, No 3, 1955, pp 27-33

A brief description of methods for determining the coefficient of exchange in the practical operations of the Main Geophysical Observatory. The authors investigate the relation between the exchange coefficient and the characteristics that govern the profiles of temperature and wind velocity (Richardson's number). They evaluate the possible error of the methods presented at 10-20%. (RZhGeol, No 6, 1956) SO: Sum.No. 713, 7 Nov 56

State Geophysics Observatory im. Voyeykov, Leningrad

Jul/Aug 53

BUDYKO, M. I.

USSR/Geophysics - Atmosphers, Water Cycle

"Laws Governing the Water Cycle of the Atmosphere," M.I. Budyko and O.A. Drozdov, Main Geophys Observatory im A.I. Voyeykov

Iz Ad Nauk SSSR, Ser Geog, No 4, pp 5-14

States that many specialists of the various institutes of the Hydrometric Service have recently been studying intensively the physical laws governing the water cycle of the atm. States that their conclusions contradict old water-economy scheme of E. Bruckner (1901) which had been, until recently, accepted in studies on irrigation and land improvement.

Source #264T84

BUDYKO
~~BUDYKO~~, M. I.

"Distribution of Meteorological Flements in the Lowest Air Layer", Izvestiya AN SSSR, seriya geograf, i geofiz. (News of the Academy of Sciences USSR, Geographic and Geophysical Series) No 4, 1946.

SO: U-3039, 11 Mar 1953

BUDYKO, M. I.

"Letter to the Editor," Meteorol. i Gidrologiya, No 1, 1955, pp 57-59

In a letter the author disputes with A. N. Konstantinov and L. A. Strauss (see the preceding abstract, 8260), who considered erroneous the author's proposed scheme of turbulent mixing in a temperature-inhomogeneous stream. The editors of the original journal "Meteorologiya i Gidrologiya" note that further discussion is inexpedient in view of the absence of the necessary experimental data for the evaluation of the computational schemes.
(RZhGeol, No 6, 1956) SO: Sum. No. 713, 7 Nov 56

The Committee on Stalin Prizes [of the Council of Ministers USSR, in the fields of science and inventions announces that the following scientific works, popular scientific books, and textbooks have been submitted for competition for Stalin Prizes for the years 1952 and 1953. (Sovetskaya Kultura, Moscow, No. 22-40, 28 Feb - 3 Apr 1954)

Name	Title of Work	Nominated by
Babko, M.T.	"Typical Rules of the [illegible] Agricultural Fields, Its Preventing and Regulation" (series of articles)	[illegible] Laboratory [illegible] T. Lysenko
Boykhman, D.L.		
Yudin, V.A.		
Kucherov, N.V.		
Berlyand, M.E.		
Krasilov, F.F.		
Tirofayev, V.P.		
Gapovskiy, V.L.		
Ivanitsev, V.A.		

FOR-W-3[illegible], 7 July 1954

BUDYKO, M.I.; POGOSYAN, Kh.P.

[Change in climate of the air closest to earth during the improvement of arid regions] Izmenenie klimata prizemnogo sloia vozdukha pri melioratsii zasushlivykh raionov. Moskva, 1954. 45 p. (MIRA 12:10)

(Climatology)

BUDYKO, M.I., redaktor; doktor fiziko-matematicheskikh nauk; MAKSIMOVA, I.G.redaktor; SOLOVEYCHIK, A.A., tekhnicheskiy redaktor

[Information collection. Present status of climatological research and ways of improving it; documents of the conference on climatology, sponsored by the Chief Hydrometeorological Service, and held June 22-25, 1953] Informatsionnyi sbornik.Leningrad, Gidrometeorologicheskoe izd-vo. No.3-4 O sovremennom sostoianii klimatologicheskikh issledovanii i putiakh ikh razvitia; materialy soveshchaniia po klimatologii pri Glavnom upravlenii gidrometsluzhby, sostoiavshegosia 22-25 iiunia 1953. 1954. 172 p. (MLRA 8:10)

1. Russia(1923- U.S.S.R.) Glavnoye upravleniye gidro-meteorologicheskoy sluzhby.
(Climatology)

USSR/ Meteorology - Solar energy

Card 1/1 Pub. 45 - 2/16

Authors : Budyko, M. I.

Title : Transformation of solar energy on the surface of the earth

Periodical : Izv. AN SSSR. ser. geog. 1, 7-14, Jan-Feb 1954

Abstract : An account is given of researches, conducted by separate individuals over a long period, on the transformations of solar energy falling upon the earth. This includes the absorption of the greater part of such energy by the earth itself and its conversion into heat, the lateral distribution of heat in the form of currents in the air and the ocean, resulting in the phenomena of weather and climate, and the role of solar energy in plant economy where chemical changes are produced by it.

Institution : A. N. ~~Boeikov~~ Voyeykov Main Geophysical Observatory

Submitted : ...

Translation M-648, 26 Jul 55

USSR/ Geography - Meteorology

Card 1/1 Pub. 45 - 3/17

Authors : Budyko, M. I.; Berlyand, T. G.; and Zubenok, L. I.

Title : Heat balance of the earth's surface

Periodical : Izv. AN SSSR. Ser. geog. 3, 17-41, May - Jun 1954

Abstract : An account is given of the work of scientists in the past in studying the problem of the heat balance of the earth's surface. From the results of these studies a formula is derived as follows: R + LE + P + A = 0, where R is the radiation balance of the underlying surface; LE, the expenditure of heat in evaporation; P, the turbulent heat exchange between the underlying surface and the atmosphere; and A, the heat exchange between the underlying surface and the lower strata. In harmony with this basic formula an analysis is made of the heat exchange on land and sea over the whole world, taking into account also the factor of light reflection. Thirty-four references; 27 USSR; 5 German; 2 USA (1925-1952). Maps; graphs; tables.

Institution: A. I. ~~Bdekov~~ Voyeykov Main Geophysics Observatory

Submitted: .....

Budyko, M. I.

FEDOROV, Ye.Ye., professor; PREDTECHENSKIY, P.P.; BUCHINSKIY, I.Ye.; SEYANINOV, G.T., professor; BOSHNO, L.V.; ALISOV, B.P.; BIRYUKOV, N.N.; GAL'TSOV, A.P.; GRIGOR'YEV, A.A., akademik; EYGENSON, M.S., professor; MURETOV, N.S.; KHROMOV, S.P.; BOGDANOV, P.N.; LEBEDEV, A.N.; SOKOLOV, V.N.; YANISHEVSKIY, Yu.D.; SAMOYLENKO, V.S.; USMANOV, R.F.; CHUBUKOV, L.A.; TROTSENKO, S.Ya.; VANGENGEYM, G.Ya.; SOKOLOV, I.F.; STYRO, B.I.; TEMNIKOVA, N.S.; ISAYEV, E.A.; DMITRIYEV, A.A.; MALYUGIN, Ye.A.; LIEDEMAA, Ye.K.; SAPOZHNIKOVA, S.A.; RAKIPOVA, L.R.; POKROVSKAYA, T.V.; BAGDASARYAN, A.B.; ORLOVA, V.V.; RUBINSHTEYN, Ye.S., professor; MILEVSKIY, V.Yu.; SHCHERBAKOVA, Ye.Ya.; BOCHKOV, A.P.; ANAPOL'SKAYA, L.Ye.; DUNAYEVA, A.V.; UTESHEV, A.S.; RUDNEVA, A.V.; RUDENKO, A.I.; ZOLOTAREV, M.A.; NERSESYAN, A.G.; MIKHAYLOV, A.N.; GAVRILOV, V.A.; TSOMAYA, T.I.; DEVYATKOVA, A.M.; ZAVARINA, M.V.; SHMETER, S.M.; BUDYKO, M.I., professor.

Discussion of the report (in the form of debates) [of the current state climatological research and methods of developing it]. Inform. sbor.GUGMS no.3/4:26-154 '54. (MIRA 8:3)

1. Chlen-korrespondent Akademii nauk SSSR (for Fedorov). 2. Glavnaya geofizicheskaya observatoriya im. A.I.Voeykova (for Predtechenskiy, Lebedev, Yanishevskiy, Isayev, Rakipova, Pokrovskaya, Orlova, Rubinshteyn, Budyko, Shcherbakova, Anapol'skaya, Dunayeva, Rudneva, Gavrilov, Zavarina). 3. Ukrainskiy nauchno-issledovatel'skiy gidrometeorologicheskiy institut (for Buchinskiy).

(Continued on next card)

BUDYKO, M. I.

USSR/Climatology

Card 1/1

Authors : Budyko, M. I., and Polosyan, Kh. P. Professors

Title : Change in climate of the surface air layer during melioration of arid regions

Periodical : Priroda, 5, 45 - 51, May 1954

Abstract : Irrigation of arid regions, forestation etc., will undoubtedly bring about a change in the humidity of the air in the layer near the ground and will change the intensity of vertical movements in the atmosphere. Irrigation of arid land will secure additional moisture of the soil. The amount of river water, entering the field during the vegetating period, may considerably exceed the amount of precipitation, especially during dry years. This additional moisture will evaporate. Forestation will somewhat increase the evaporation, but by retaining the snow on fields and by reducing winds, it will increase the moisture of the soil, during spring snow thawing season. Graphs.

Institution : ....

Submitted : ....

BUDYKO, M. I., BERLYAND, T. G. and ZUBENOK, L. I.

"Procedure for Climatological Computations of the Components of Heat Balance". Trudy Gl. Geofiz. Observ., No. 48, pp 5-16, 1954.

The equation of heat balance can be represented in the form R - LE + P + A = 0, where R is the radiational balance of the underlying surface, LE is the expenditure of heat in evaporation, P is the turbulent heat exchange between the underlying surface and the atmosphere, and A is the heat exchange between the underlying surface and the lower lying layers. For dry land the quantity A is equal to the change in heat content of soil over a definite period and in the mean year is close to zero. For oceans the quantity A in the mean year is equal to the input or output of heat in consequence of horizontal heat exchange connected with sea currents. In conclusion the authors present examples of computations of the components of heat balance for Moscow and a point on the ocean. (RZhGeol, No 11, 1955)

SO: Sum No 884, 9 Apr 1956

Budyko, M. I.

8.5-19 551.511.33:551.52 551.582.3(26)

Atlas teplovogo balansa. [Atlas of thermal balance.] Ed. by M. I. Budyko. Leningrad, 1955. 41 p. 41 cm×39 cm. Almost entirely charts (in color). At head of t-p: Glavnoe Upravlenie Gidrometeorologicheskoĭ Sluzhby pri Sovete Ministrov Soiuza SSSR, Glavnaia Geofizicheskaia Observatoriia im A. I. Voeikova. DWB. Also: Budyko, M. I. and Efimova, N. A., O tochnosti kart sostavliaiushchikh teplovogo balansa. [Accuracy of charts of the components of thermal balance.] *Leningrad. Glavnaia Geofizicheskaia Observatoriia, Trudy*, 50(112):111–119, 1955. 4 figs., table, 13 refs. DAWS—The first work is a compilation of monthly and annual charts (in color) of (A) total solar radiation, (B) radiation balance of the earth's surface (continents and oceans), (C) loss of heat by evaporation (oceans), (D) turbulent heat exchange between sea and atmosphere, (E) evaporation from oceans. An annual chart of heat lost or gained by ocean surface due to currents (advective heat exchange) is also included. An ample explanation or summary precedes each of the 6 major sections. The charts are nicely drawn in attractive colors and on a convenient world projection which allows data to be presented from 70°N to 63°S, charts which embrace only the oceanic areas (i.e., evaporative heat loss and turbulent heat exchange) are supplemented by a page containing graphs of the annual regime of the element for 12 places on continents in different parts of the world. All heat or radiation charts use g cal/cm² year (or month), and evaporation in mm/year (or month). The methods of calculation are described by M. I. Budyko et al. in their **Teplovoĭ balans poverkhnosti zemli**, (*see* 7H-61, Aug. 1956, *MAB*), and in book by M. I. Budyko, 1956 (*see* 8.5-20, *this issue*). In the second article, the techniques for evaluating the accuracy of existing methods for calculating the constituents of radiation and heat balance at the earth's surface are outlined briefly and the accuracy of the individual constitutents of the radiation and heat balance used in constructing climatologic maps is determined. The accuracy of measurement of total radiation, radiation balance, of heat loss by evaporation etc. are discussed. Data on radiation balance for physiographically defined regions such as tundra, desert, etc. are presented. *Subject Headings:* 1. Heat balance atlases 2. Radiation balance charts 3. Evaporation from seas 4. Marine climatic atlases 5. Radiation measurement accuracy. I. Leningrad. Glavnaia Geofizicheskaia Observatoriia.—*M.R., I.L.D.*

4
1 4F4D

EE

BUDYKO, M.I., red.

[Atlas of heat balance] Atlas teplovogo balansa. Leningrad, 1955. 41 p. (MIRA 14:2)

1. Leningrad. Glavnaya geofizicheskaya observatoriya. (Earth temperature)

Budyko, M. I.

KOPANEV, I.D., kandidat geograficheskikh nauk; BUDYKO, M.I., doktor, fiziko-matematicheskikh nauk; MAKSIMOVA, I.G., redaktor; BRAYNINA, M.I., tekhnicheskiy redaktor

[Effect of shelterbelts on the distribution of snow cover in the arid area of the European part of the Soviet Union] Vliianie lesnykh polezashchitnykh polos na raspredelenie snezhnogo pokrova v zasushlivoi zone evropeiskoi territorii SSSR. Pod red.M.I.Budyko. Leningrad, Gidrometeorologicheskoi izd-vo, 1955. 65 p.
(Snow) (Windbreaks, shelterbelts, etc.) (MLRA 9:1)

BUDYKO, M.I.

AID P - 1444

Subject : USSR/Meteorology and Hydrology

Card 1/2 Pub. 17-a - 18/23

Author : Budyko, M. I., Prof., Dr. of Phys.-Math. Sci.

Title : Determination of evaporation from the soil surface

Periodical : Met. i gidro., No.1, 52-58, Ja - F 1955

Abstract : An analysis is given of the various methods of determination of the annual and seasonal (monthly) amount of evaporation from the soil surface, e.g. those of E. M. Ol'dekop, B. V. Polyakov, F. Albrecht, and N. A. Bagrov (the latter improves Ol'dekop's formula). The author suggests a simplified method of computing the annual course of evaporation based on his formula connecting the difference between the humidity of the soi in the beginning of the observation period (W_1) and the end (W_2), with the critical humidity (W_k) when plan begin to wither, the evaporation (E_o), the water balance (r) depending on precipitation, and the runoff (f).

Translation - M-740, 30 Aug 55

Mct. i gidro., 1, 52-58, Ja - F 1955 AID P - 1444

Card 2/2 Pub. 17-a - 18/23

The results of this method were checked in practice and proved satisfactory. Formulae, 30 Russian references and 2 German

Institution: Main Administration of the Hydrometeorological Service at the Council of Ministers of the USSR

Submitted : No date

BUDYKO, M.I.

Climatic conditions of humidification on continents. Izv.AN SSSR. Ser.geog. no.2:5-15 Mr-Ap '55. (MLRA 8:6)
(Geographical societies)

BUDYKO,M.I.

Climatic conditions of humidification in continents. Izv. AN SSSR. Ser.geog. no.4:3-15 Jl-Ag'55. (MIRA 8:10)

1. Glavnaya geofizicheskaya observatoriya imeni A.I.Voyeykova
(Evaporation)

BUDYKO, M.I.; YEFIMOVA, N.A.

Accuracy of charts representing heat balance components. Trudy GGO no.50:111-119 '55. (MLRA 9:8)
(Solar radiation) (Atmospheric temperature)

BUDYKO, M. I.

"Indices climatiques d'aridite," a paper presented at the International Geographical Congress, Rio de Janeiro, August 1956, published in book Essais de Geographie, Moscow-Leningrad, 1956.

Call Nr: AF 1138795

AUTHOR: Budyko, M. I.
[Mikhail Ivanovich]

TITLE: Heat Balance of the Earth's Surface (Teplovoy balance zemnoy poverkhnosti)

PUB. DATA: Gidrometeorologicheskoye Izdatel'stvo, Leningrad, 1956, 256 pp., 3,000 copies

EDITOR: Yasnogorodskaya, M. M.; Responsible Ed.: Gandin, L. S.; Tech. Ed.: Soloveychik, A. A.

PURPOSE: The book is intended for scientists, graduates and students of climatology, meteorology and hydrology of the earth and oceans, and all other scientists interested in the transformation of solar energy on the face of the Earth.

COVERAGE: The book covers climatology of the heat balance of the earth's surface and analyzes various approaches in determining the heat balance components. The geographical distribution of all the

Card 1/5

Call Nr: AF 1138795

Heat Balance of the Earth's Surface (Cont.)

components of the balance of subjacent surfaces and their yearly and daily variations are given. The application of climatological principles to physical geography, hydrology and agrometeorology is discussed in relation to soil improvement. Grigor'yev, A. A. Academician, is cited in connection with work in this field. There are a total of 344 references, 250 of which are Soviet.

TABLE OF CONTENTS:

Card 2/5

BUDYKO, M.I.

BUDYKO, M.I., doktor fiziko-matematicheskikh nauk, professor, redaktor; YASNOGORODSKAYA, M.M., redaktor; BRAYNINA, M.I., tekhnicheskiy redaktor

[A.I.Voeikov and present-day problems of climatology] A.I. Voeikov i sovremennye problemy klimatologii. Leningrad, Gidrometeor. izd-vo, 1956. 282 p. (MLRA 10:4)
(Voeikov, Aleksandr Ivanovich, 1842-1916) (Climatology)

14-57-7-14760

Translation from: Referativnyy zhurnal, Geografiya, 1957, Nr 7, p 83 (USSR)

AUTHOR: Budyko, M. I.

TITLE: Climatic Factors in Humidity Formation (Klimaticheskiye usloviya uvlazhneniya)

PERIODICAL: V sb: A. O. Voyeykov i sovrem. probl. klimatol. Leningrad, Gidrometeoizdat, 1956, pp 29-44.

ABSTRACT: This article represents a survey of literature on the problem of climatic factors in humidity formation at the earth's surface (A. I. Voyeykov and others). From the available material on the subject of heat balance it is possible to arrive at a number of conclusions dealing with the rules which govern various factors in humidity formation. In particular, it is possible to determine by a physical method the probable amount of evaporation (vaporization) E_0 from the surface of a moist ground. This is done with the help of equation

Climatic Factors in Humidity Formation (Cont.)

$E_0 = \rho D(q_s - q)$, where ρ is the density of air, D is the coefficient of external diffusion, q_s is the concentration of saturated water vapor at the temperature of the surface of evaporation, q is the concentration of water vapor in the air (atmospheric humidity) at the altitude at which the determinations are made (2 m). As the soil moisture increases, the amount of heat used in evaporation increases while the turbulent heat loss decreases. The loss of heat used in evaporation can not grow infinitely. At $LE_0 > R_0 - B$(L - (Tr. note: a line of Russian type apparently missing) concealed heat of vaporization, R_0 is the radiational balance of the moist surface, B is the heat circulation in the soil) (sic) over a large surface of evaporation in the near-earth air layer there originates a temperature inversion which lowers the intensity of the turbulent translocation near the earth's surface, so that further increase of the heat loss due to evaporation becomes impossible. The heat loss due to evaporation from a moist surface is close to $R_0 - B$, and in the course of a year, when heat circulation in the soil is near zero, the loss becomes equal to R_0. Annual amount of evaporation at various climatic conditions is close to R_0/L. This fact makes it

Climatic Factors in Humidity Formation (Cont.)

possible to use the radiation index of dryness R_0/Lr or the index of moisture L_r/R_0 (r represents precipitation) as the index of climatic factors of humidity formation. In using the radiational index of humidity formation it is necessary to take into consideration the influence of atmospheric circulation on the evaporation. With an absolutely motionless atmosphere the average values of heat loss due to evaporation and the turbulent exchange for the ground surface will be close to zero because of the absence of the latter, and the mean annual radiational balance for dry land at all latitudes will also be close to zero. The difference between the amount of evaporation and the total precipitation during the period of growth of agricultural crops in a dry climate represents an important index of necessary irrigation water (for many plants this magnitude is equal to the whole amount of necessary irrigation water). Thus, from the data on radiational balance, air temperature and humidity, and precipitation, it is possible to calculate the necessary amount of irrigation water for the weather and climate conditions of given districts. The methods presented above are appropriate for determining mean climatic factors in humidity formation for more or

Climatic Factors in Humidity Formation (Cont.)

less extensive time periods. In determining these factors for a period of a year it is necessary to utilize the data on humidity in the upper soil layers. This humidity can be determined with the help of the formula $\Delta w = r - E - f$, where Δw is the variation in the moisture content of soil for a given period of time, and f is the runoff. Changes in soil humidity and evaporation for any period of time can be calculated from the formula $E = E_0 \cdot w/w_0$. The author also discusses the climatic factors in humidity formation over the oceans. The salt content of the uppermost water level depends on the relation between the precipitation and the evaporation (as the precipitation increases and evaporation diminishes, the salt content becomes higher; the reverse is also true). The article contains information on the regular increase in the salt content with a growth of the "dryness index" E/r. Data on the water balance of the oceans are extremely important in estimating the mean climatic factors in humidity formation over various oceans. Such data were recently obtained from the content of the "Atlas Teplovogo Balansa" ("Atlas of Heat Balance") (edited by Budyko, 1955) and from other sources. In an average year the Atlantic and the Indian Oceans

Card 4/5

Climatic Factors in Humidity Formation (Cont.)

receive a substantial amount of water from the northern Arctic and the Pacific Oceans. The amount of water coming from the northern Arctic Ocean is approximately equal to the amount taken in by the Atlantic Ocean. The amount of water leaving the Pacific Ocean is approximately equal to the amount entering the Indian Ocean. In connection with these facts, the climate of the northern Arctic and the Pacific Oceans should be considered relatively more humid than the climate of the Atlantic and Indian Oceans. The mean salinity of the Atlantic Ocean is found to be much higher than the salinity of the northern Arctic Ocean, while the salinity of the Pacific Ocean is somewhat lower than that of the Indian Ocean. The investigation of the climatic factors in humidity formation indicates that the mean annual amount of precipitation falling onto the surface of the whole earth is equal to the mean annual evaporation (93 cm/year). The article includes a bibliography of 45 titles.

Card 5/5

I. P. Danilina

14-57-7-14761

Translation from: Referativnyy zhurnal, Geografiya, 1957, Nr 7, pp 83-84 (USSR)

AUTHOR: Budyko, M. I.

TITLE: Climatic Indices of Aridity (Klimaticheskiye pokazateli aridnosti)

PERIODICAL: V sb: Vopr. geografii, Moscow-Leningrad, AN SSSR, 1956, pp 138-145.

ABSTRACT: Proper knowledge of climatic factors operating in formation of humidity over the continents is extremely important in explaining broad geographical trends, particularly in explaining geographical zonal distributions. This work must take into account not only the precipitation but also the evaporation possible under given external conditions. At the beginning of the twentieth century the relation of precipitation to evaporation from a water evaporator was used in this work; during the second decade the relation of precipitation to various combinations of air temperatures was

Card 1/3

Climatic Indices of Aridity (Cont.)

broadly applied as a humidity index. Moreover, amounts of precipitation were juxtaposed with the humidity deficiency in respect to the amount of evaporation. But the values obtained by these means were entirely empirical in nature, which fact was brought about by the insufficient knowledge of the mechanism of heat and humidity processes. The use of data on the heat balance of the underlying surface made it possible to establish the physical basis of a method for calculating the potentially possible amount of evaporation HE_0 from the equation of heat balance. This process calls for the knowledge of the radiational balance of the humid surface R_0, heat content of the soil B, integral characteristics of the turbulent translocation, and also the temperatures and the humidity of the air. It was possible to determine that the heat loss due to evaporation LE_0 (L is the temperature of vapor formation) for a humid surface proves to be close to R_0 - B, and for a period of a year becomes equal to R_0. Calculation of evaporation typical for various climatic conditions proved that the amount of evaporation differs only slightly from the value of R_0/L. Because of this fact the values of R/Lr and Lr/R are considered to be the indices of

Card 2/3

Climatic Indices of Aridity (Cont.)

dryness and of humidity respectively (r represents the total annual precipitation). Computed values of the dryness index agree fairly well with the borders of natural zones shown on the world maps. Data on the humidity in the upper layers of the soil are necessary for the determination of factors involved in humidity formation during periods shorter than a year. Because available data on the soil humidity are inadequate, the author recommends the use of a method of indirect calculation of soil humidity dynamics. Such a calculation should be based on the equation of water balance, on the proposed estimate of the evaporation, and also on the investigation of the equation $E/E_0 = W/W_0$, where E and E_0 represent the evaporation and the potential evaporation, W and W_0 represent the productive and the so-called "critical" soil humidity. The data obtained in this way are of great scientific and practical significance. Their utilization is particularly important in hydrological computations used for determining irrigation water requirements which depend on the various weather and climate conditions, and in other problems. The article includes a bibliography of 34 titles.

Card 3/3 Yu. R.

GERASIMOV, I.P.; ARMAND, D.L.; BUDYKO, M.I.; DAVITAYA, F.F.; DZERDZEYEVSKIY, B.L.; KUNIN, V.N.; L'VOVICH, M.I.; RIKHTER, G.D.; SHEVTSOV, P.F.

Thermal and hydrological regime of the earth's surface, its role in the dynamics of natural processes, geographical differences, and methods of transforming it for practical purposes. Izv.AN SSSR.Ser.geog. no.4: 47-59 Jl-Ag '56. (MLRA 9:10)
(Hydrology)

BUDYKO, M.I.; ZUBENOK, L.I.; STROKINA, O.A.

Determining the integral factor of turbulent diffusion. Meteor. i gidrol. no.12:34-35 D '56. (MLRA 10:1)
(Atmosphere)

GRIGOR'YEV, A.A., akademik; BUDYKO, M.I.

Periodic law of geographic zonality. Dokl.AN SSSR 110 no.1:129-132 S-O '56. (MLRA 9:11)

1.Institut geografii Akademii nauk SSSR, Glavnaya geofizicheskaya observatorya imeni A.I.Voyeykova.
(Life zones) (Phytogeography)

BUDYKO, M.I.

3(7) PHASE I BOOK EXPLOITATION SOV/1685

Akademiya nauk SSSR. Komitet po geodezii i geofizike.

Tezisy dokladov na XI General'noy assambleye Mezhdunarodnogo geodezicheskogo i geofizicheskogo soyuza. Mezhdunarodnaya assotsiatsiya meterologii (Abstracts of Reports at the 11th General Assembly of the International Union of Geodesy and Geophysics. The International Association of Meteorology) Moscow, 1957. 38 p. /Parallel texts in Russian and English or French/ 1,500 copies printed. No additional contributors mentioned.

PURPOSE: This booklet is intended for meteorologists.

COVERAGE: These reports cover various subjects in the field of meteorology. Among the specific subdivisions discussed are: the heat balance of the Earth's surface jet streams, transference of heat radiation, electric coagulation of cloud particles, turbulent diffusion, cloud studies, and others. Abstracts of all the articles are translated into either French or English. There are no references given.

TABLE OF CONTENTS:

Card 1/3

BUDYKO, M. I.

"The Climatic Factors of Water Balance on the Continent" by M. I. Budyko and O. A. Drozdov

report presented at the 3rd All-Union Hydrological Congress, 7-17 Oct 1957, Leningrad.

reports bubl. in 10 vol. book form - Leningrad, Gidrometeorizdat, 1958, vol. 1, 242pp

BUDYKO, M.I.

Washington session of the Commission on Climatology. Izv. AN SSSR. Ser. Geog. no.3:121 My-Je '57. (MIRA 10:12)
(Washington, D.C.--Climatology)

AUTHOR: Budyko, M. I. 5o-11-2/9

TITLE: Meteorologic Investigations in the USSR (Meteorologicheskiye issledovaniya v SSSR)

PERIODICAL: Meteorologiya i Gidrologiya, 1957, Nr 11, pp. 7-16 (USSR)

ABSTRACT: Since the second half of the 19th century meteorologic experiences have widely developed.

Physics of the Atmosphere.

Here the investigation of solar energy reaching the earth as well as of its possibilities of transformation take an important place. After 1917 the method of experimental investigations of radio fluxes as well as of those of short- and longwave radiations of the atmosphere were worked out. The existing radiation measuring network has about 2oo stations at the majority of which not only shortwave radiations of the sun but also the radiations balance and the elements of thermal balance are measured.

Besides the observation of the earth in a number of scientific institutes the radiation conditions of middle and higher air layers were investigated by means of experiments which were carried out with flying experimental apparatus.

In a number of investigations of different scientists

Card 1/5

the problem of the basic trends of radiation balance which are based on the results of a number of extensive observations as well as of those of meteorologic processes were solved.

The use of indirect methods of calculation made it possible later to work out the maps of radiation layers of the surface of the earth. These results of investigations of the atmospheric processes of radiation were generalized in a number of important single descriptions. These single descriptions are mentioned in the original text.

Of great importance for the working out of the problems in the physics of close-to-earth layers of the air were the investigations of the turbulent change in the lower layers of the atmosphere which had been carried out in the fourties by the collaborators of the Geographical Laboratory and the Geophysical Institute AN USSR. In the course of these investigations the problem of the influence of the steadiness on the intensity of the turbulent mixing process were investigated in detail.

M. I. Judin suggested in his works a theory of the influence of field-protecting forest bands on the turbulent change in the close-to-earth layer of the air. He stated that the changes of this turbulent change behind the forestbands

differ greatly from the changes of the velocity of wind.

With other investigations based on theoretic calculations and experimental investigations the effectiveness of different methods of plant protection against early frosts were investigated and recommendations concerning the most effective methods of fighting early frosts were worked out.

A great progress in the problem of the development of apparatus for meteorologic observations in the close-to-earth layer of the air was the bringing about of collaboration among scientists in the field of hydrometeorologic apparatus building for automatic meteorologic stations.

Of greatest importance for dynamic meteorology were the investigations carried out by N.Ye. Kotschin who investigated the problem of the steadiness of separation surface in the atmosphere, of the kinematics and dynamics of cyclones and the theory of zonal circulation.

During the last time three working teams for the work in the field of dynamic meteorology were created:

1) Under the direction of I. A. Kibel a theoretical method of short-term weatherforecast was worked out.

Card 3/5 2) Under the direction of A. M. Obukhov, together with A. N.

Kolmogoroff, the "Theorem of the Two-Thirds" was discovered. 3) Under the direction of M. I. Yudin the important results in the elaboration of hydrodynamic methods for short-term weatherforecast were found.

Climatology.

As basic material for the climatologic investigations serve the observations of meteorologic stations. Hydrometeorologic service extended the network of meteorologic stations and in 1956 it had already 3316 stations of second class and 5955 observation stations.

From 1936-47 the Central Geographic Observatory did great work for the composition of the "Climatologic Reference Book of the USSR." The material of this reference book served as basis for the composition of a number of climatologic maps and for the "Climatologic Map of the USSR".

A new trend in the description of climate was taken in the work of Ye. Ye. Fedorov, L. A. Chubukov, A. I. Baranov a. o., in which a complex method of the course characteristics of meteorologic elements was used.

The new theory of the change of humidity, which was built up with respect to the influence af atmospheric circulation showed that stear which is transferred by air flows over great

distances in horizontal direction is of essential importance for the formation of rains.

Important for the elaboration of the problem of the influence of climatologic factors on various nature processes were the known investigations of A. A. Grigor'yev in which connections between the processes of heat and humidity as well as of physical-geographic zonal division were studied.

AVAILABLE: Library of Congress

1. Meteorology-Progress-USSR

BUDYKO, M.I.

PHASE I BOOK EXPLOITATION 966

Leningrad. Glavnaya geofizicheskaya observatoriya

Sovremennyye problemy meteorologii prizemnogo sloya vozdukha; sbornik statey (Modern Problems in the Meteorology of the Near-Surface Atmospheric Layer; Collection of Articles) Leningrad, Gidrometeoizdat, 1958. 231 p. 900 copies printed.

Additional Sponsoring Agency: USSR Glavnoye upravleniye gidrometeorologicheskoy sluzhby

Ed. (title page): Budyko, M.I., Doctor of Physical and Mathematical Sciences; Ed. (inside book): Vlasova, Yu.V.; Tech. Ed.: Sergeyev, A.N.

PURPOSE: This book is addressed to meteorologists, scientists and technicians investigating phenomena occurring in the near-surface layer of the atmosphere.

Card 1/5

COVERAGE: The book contains 14 reprints of reports presented at the May, 1957 conference of the Scientific Council of the Main Geophysical Observatory im. A.I. Voyeykov. The purpose of the conference was to summarize the present status of the science of the meteoroloby of the near-surface layer of air, review its latest developments, and discuss both theoretical and practical problems in the field. Phenomena occurring in the near-surface layers are described as of great importance because of their great influence on the formation of climate and weather. Five articles are concerned with studies of meteorological phenomena in areas with uncommon or very special types of climate, such as the Antarctic, where climatic and weather conditions have been investigated to a lesser degree than in other areas. Typical are the reports of N.P. Rusin and D.L. Laykhtman who present the results of their investigation in the Arctic and the Antarctic. The text is profusely illustrated with photographs, diagrams and tables.

TABLE OF CONTENTS:

Card 4/5

AVAILABLE: Library of Congress

MM/sfm
1-8-59

Card 5/5

BUDYKO M. I.

3(5) PHASE I BOOK EXPLOITATION SOV/1781

Akademiya nauk SSSR. Institut geografii.

Voprosy fizicheskoy geografii (Problems in Physical Geography) Moscow, Izd-vo AN SSSR, 1958. 370 p. Errata slip inserted. 1,500 copies printed.

Resp. Ed.: G.D. Rikhter, Doctor of Geographical Sciences, Professor; Ed. of Publishing House: B.N. Tugarinov; Tech. Ed.: N.D. Novichkova.

PURPOSE: This book is intended for meteorologists, hydrologists, pedologists, geologists, and students of physical geography in general.

COVERAGE: These articles are dedicated to Academician A.A. Grigor'yev in commemoration of his seventy-fifth birthday anniversary. They treat problems in physical geography pertaining to the northern regions of the USSR and particularly those of Yakutia. The majority of the articles are devoted to questions of latitudinal and vertical zonation and contain much factual material on the relationship between the various geographic components. Practical conclusions and meteorological principles are cited. Each article is accompanied by maps, photographs and numerous bibliographic refs/essays.

Card 1/4 3

50-1-23/26

AUTHOR: Budyko, M. I.

TITLE: The Meteorological Conference in Berlin (Meteorologicheskaya konferentsiya v Berline)

PERIODICAL: Meteorologiya i Gidrologiya, 1958, Nr 1, pp. 65-65 (USSR)

ABSTRACT: From october 14 to 16, 1957 the first scientific conference of the Meteorological Society in which the following countries participated, was held in Berlin: the GDR, Austria, Hungary, Poland, the USSR, the German Federal Republic and Czechoslovakia. The work of the conference was done in five sections: for synoptics and aerology (chairmen Professor Schneider-Karnus and Professor Flen); for dynamics and atmospheric circulation (Professor Mügge); for radiation processes (Hinzpeter and Foytsik); for bioclimatology and agrometeorology (Hentschel and Mede); for ionosphere and atmospheric electricity (Professor Lauter). The chairman of the entire conference was the chief of the Hydrometeorological Service of the GDR, Professor Philips. The vice-president of the AN of the GDR, the renowned German meteorologist Ertl, actively participated. From the USSR M. I. Budyko, A. A. Syyko and S. P. Khromov took part in the conference.

AUTHOR: Budyko, M.I.

SOV-10-58-4-12/28

TITLE: A Study of the Heat Balance of the Earth Surface (Izucheniye teplovogo balansa zemnoy poverkhnosti)

PERIODICAL: Izvestiya Akademii nauk SSSR - Seriya geograficheskaya, 1958, Nr 4, pp 83-86 (USSR)

ABSTRACT: In April 1958, the author received the Lenin prize for his scientific studies "The Heat Balance of the Earth's Surface" and "Atlas of the Heat Balance", both published in 1955-1956. Reviewing the first publication, he recalls the systematic research work started by the Glavnaya Geofizicheskaya Observatoriya imeni A.I. Voyeykov (Chief Observatory of Geophysics imeni A.I. Voyeykov) in 1945 on climatological regularities of radiation and heat balances. In this connection he mentions the following scientists: T.G. Berlyand, L.I. Zubenok, N.A. Yefimova and A.A. Grigor'yev. Research work recently completed by co-workers of the Observatory, consisted in preparing monthly, seasonal and annual maps of the heat balance for various geographical regions. The author attaches special importance to the attempt made by the Observatory to apply the material collected on the heat balance in physical-geographical research work. During these studies,

Card 1/2

special attention was paid to determine the correlation of the heat balance of the earth's surface with the water balance. This made it possible to complement existing concepts of climatic factors of the continental water regime.

1. Earth--Surface properties 2. Heat--Measurement 3. Water --Climatic factors

SOV-25-58-10-9/48

AUTHOR: Budyko, M.I., Doctor of Physical and Mathematical Sciences, Winner of the Lenin Prize, Director

TITLE: The Balance of Miraculous Transformation (Balans chudesnykh prevrashcheniy)

PERIODICAL: Nauka i zhizn', 1958, Nr 10, pp 13 - 16 (USSR)

ABSTRACT: The author describes the importance of sun energy and the theoretical and practical considerations which lead to the development of actinometry - the science of sun energy. In this connection Russian scientists K.A. Timiryazev, A.I. Voyeykov and Professor N.N. Kalitin are mentioned; the latter Co-worker of the Main Geophysical Observatory, helped to develop more than 30 actinometric devices. Since 1945, the Main Geophysical Observatory has studied methods for determining the incoming sun energy and ways of transforming it. As a result of these research studies which were carried out in cooperation with T.G. Berlyand, L.I. Zubenok and N.A. Yefimova, it was possible to prepare the first world maps on the quantity of sun energy reaching the earth's surface. These maps have been published as "The Atlas of the

Card 1/2

Heat Balance". With the help of these maps, scientists have succeeded in calculating the average energy balance for the earth as a whole. There are 2 photographs and 1 drawing.

ASSOCIATION: Glavnaya geofizicheskaya observatoriya imeni A.I. Voyeykova (Main Geophysical Observatory imeni A.I. Voyeykov)

1. Solar energy--Determination

BUDYKO, M. I.

"On the Study of the Geographical Distribution of the Radiation Regime."

report presented at the Symposium on Radiation Int'l Assn. of Meteorology and Atmospheric Physics, IUGG, 19-25 Jul 1959. Oxford, UK.

AUTHOR: Budyko, M.I. SOV/10-59-1-3/32

TITLE: On the Heat Balance of Live Organisms (O teplovom balanse zhivykh organizmov)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya geograficheskaya, 1959, Nr 1, pp 29-35 (USSR)

ABSTRACT: This article is the full text of a report delivered by the author at a session dedicated to the 75. anniversary of Academician A.A. Grigor'yev. It notes the services of A.A. Grigor'yev in advancing the idea of the significance of consideration of heat-energy transformations for the study of various geographic natural processes, in particular the study of differences between the temperatures of the air and those of members of the vegetable and animal kingdoms, for the benefits of agriculture and as a help in solving numerous problems of physical geography. The author's fellow worker G.T. Tsitsenko made an attempt at the appoximate ascertainment of heat sensations of human beings in various

Card 1/2

climatic zones with the medium of a thermal balance equation. A special chart was drawn, on the basis of her findings, showing the characteristic conditions of heat sensations at various seasons of the year within the European part of the USSR, that is useful in determining the thermo-insulating qualities of clothing needed for human wear.

ASSOCIATION: Glavnaya Geofizicheskaya observatoriya imeni A.I. Voyeykova (Main Geophysical Observatory imeni A.I. Voyeykov)

507/10-59-3-1/32

3(4)

AUTHORS: Grigor'yev, A.A., Academician, and Budyko, M.I.

TITLE: Classification of the Climates of the USSR.

PERIODICAL: Izvestiya Akademii nauk SSSR, Seriya geograficheskaya, 1959, Nr 3, pp 3-19 (USSR)

ABSTRACT: The authors describe the present situation of climatological studies in the USSR and abroad, especially in Germany. Afte having explained and criticized other systems, they explain and justify their own proposal which they had followed in drafting the climatological map of their country (the map is attached to the article). Their classification does not only reflect physical-geographical uniformities but is also influenced by some climatologic-genetic regularities. Aver age temperatures and average factors of dryness were taken into consideration as well. Geobotanical charts were used a countercheck. Table 1 shows the characteristics of 4 dif ferent degrees of humidity of a climate. Table 1a lists th characteristics of 5 different warm zones (from plus 10° C to the total yearly temperature up to 4,400°). Table 2

Card 1/3

Classification of the Climates of the USSR

shows the characteristics of 6 different cold zones (from the average yearly temperature above 0° down to -32°). Every region is characterized in their system by three signs (e.g. II 4 D) expressing the mean values of humidity, heat and cold of the region. Table 3 is an over-all survey of the new classification of the Soviet climates. A vertical evaluation of the climates is but partially taken into consideration. The USSR is said to have 12 types of basic climatic zones for the warm period, 31 for the winter season. At the end, a more detailed characteristic of the basic Soviet climates is given. More accurate regional observations are to be organized all over the Soviet-Union. The following scientists have collaborated on this study: L.I. Zubenok, N.A. Yefimova, V.V. Mukhenberg, A.P. Gal'tsov, O.A. Drozdov, G.D. Rikhter, Ye.S. Rubinshteyn and A.M. Semenova-Tyanshanskaya. The author also mentions the following Soviet scientists: F.F. Davitaya, S.A. Sapozhnikova, G.T. Selyaninov, A.I. Kaygorodov, B.P. Alisov, M.I. Budyko, A.A. Grigor'yev, L.P. Seryakova, Ye.M. Lavrenko, V.B. Sochava whose names

Classification of the Climates of the USSR

are also recorded in the reference list. There are 4 tables, 3 graphs, 1 map, and 37 references, 30 of which are Soviet, 6 German and 1 Swedish.

ASSOCIATION: Institut geografii AN SSSR (Institute of Geography of the AS USSR) Glavnaya geofizicheskaya observatoriya (The Main Geophysical Observatory).

3(7) SOV/5o-59-7-15/2o

AUTHOR: Budyko, M. I.

TITLE: Determination of Evaporation by the Method of Penman (Opredeleniye ispareniya po metodu Penmana)

PERIODICAL: Meteorologiya i gidrologiya, 1959, Nr 7, pp 49 - 5o (USSR)

ABSTRACT: This is a critical review of Penman's method for the determination of the evaporation quantity as it is put forward in his papers (Refs 5,6,7,8,9,10). It is pointed out that the assumptions made by Penman reduce the value of the computation accuracy. For instance, the heat exchange between the active surface and the underlying ground layers must not be neglected in all cases. The most outstanding drawback of Penman's method is the use of the evaporation rate of a water surface as a general characteristic for the external factors of evaporation. The computations carried out here show that the differences between the evaporation of a water surface and that of the mainland considerably change with a change in latitude. It would be more convenient to use those characteristics which directly refer to the conditions on the mainland surface for which the evaporation quantity is calculated. There are 11 references, 4 of which are Soviet.

BUDYKO, M.I.

"Radiation Balance and Heat Balance of Oceans."

[Institute of Oceanology Academy of Sciences USSR]

report to be presented at the 12th General Assembly of the International Union of Geodesy and Geophysics, Helsinki, Finland, 25 Jul- 6 Aug 1960.